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## PRESENTATION OUTLINE



- Project:
  - Project Background
  - Goals
  - Impacts
  - Components
  - Funding
  - Schedule
  - Questions?

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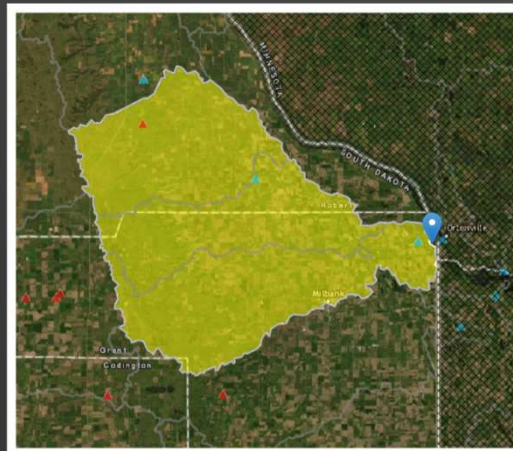
# PROJECT BACKGROUND

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## PROJECT LOCATION



- The Whetstone River is a tributary of the Minnesota River, approximately 35 miles long, beginning in the Coteau des Prairies region in South Dakota.



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## PROJECT LOCATION



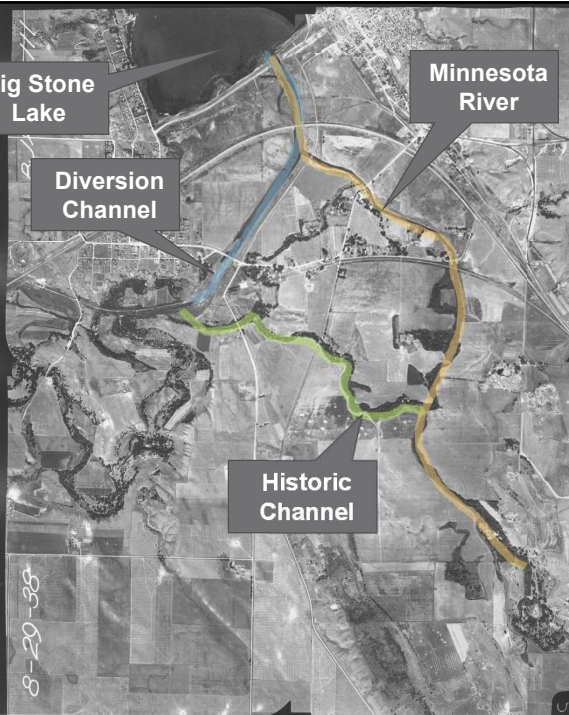
- The project is generally located in the abandoned historic Whetstone River channel and the north-south roadways, south of Ortonville



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## PROJECT HISTORY

- Historically the Whetstone River flowed into the Minnesota River south of Ortonville.
- The river was diverted into Big Stone Lake in the 1930's to increase Big Stone Lake levels during times of drought.
- The river now flows into Big Stone Lake, just upstream from the Big Stone Lake Dam.



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## PROJECT HISTORY



The dam in Ortonville controls the lake elevations.



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## PROJECT HISTORY



The historic channel was abandoned and currently only has flows from adjacent land.



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## PROJECT HISTORY



In recent years, high flows have caused flooding in Big Stone Lake, with the Whetstone River contributing a substantive amount of water.

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## PROJECT GOALS

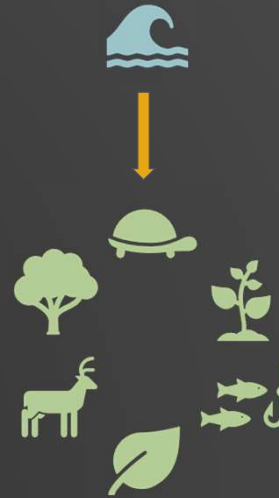
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## PROJECT GOALS



### RESTORATION

- Restore ecological services by reestablishing perennial flow to an estimated 9,000 feet of open channel. (Hydrologically and ecologically reconnect a portion of the Whetstone River to the Minnesota River.)



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## PROJECT GOALS



### CONDITION IMPROVEMENT


- By default, improve conditions within Big Stone Lake
- Reduce nutrient loads and improve water quality and reduced flooding








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**PREVIOUS PROJECT WORK** 

-  **Survey:**  
Winter of 2013 and 2014
-  **Hydrology Calculations:**  
Summer of 2014
-  **Hydraulic Calculations:**  
Winter of 2014
-  **Public Hearing:**  
February 23, 2015
-  **DNR Grant Secured and  
Primary Landowner  
Negotiations:** Summer 2019

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# PROJECT COMPONENTS

Alternative 2b

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## PROJECT COMPONENTS

Preferred

Alternative 2b

## 2-Year Compound with Setback Levees


**Highlights:**

- Reasonable reduction in lake flood levels
- Less long-term maintenance
- Less overall costs

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## PROJECT COMPONENTS




- **Diversion Weir** – A Diversion Weir will be constructed in the current Diversion Channel.
- The weir will be set at an elevation that pushes all low flows into the Historic Whetstone Channel.
- Large flows will still go to Big Stone Lake, but less.

Alternative 2 2 Year Compound Channel			
	Total Whetstone Flow (cfs)	Peak Flow Restored to Whetstone (cfs)	% of peak diverted
2-year	1119	1119	100%
5-year	3017	1669	55%
10-year	4780	1943	41%
50-year	9757	3188	33%
100-year	12225	3419	28%

These flow splits assume ice at the Highway 12 bridge

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## PROJECT COMPONENTS




- **Excavated Channel** – Where sediment has filled in the historic channel, it will be excavated. In other areas, only tree and brush clearing will occur. The embankment on the west side of the historic channel will be excavated through.

Excavate through berm

Excavate channel sediment

Clear trees and brush



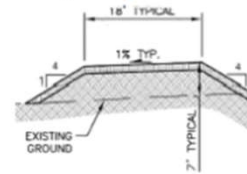
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## PROJECT COMPONENTS



- **100-Year Levees** – Will be provided if necessary, to protect structures (homes, businesses, etc) from the 100-year flood with 3 feet of freeboard.
- **Ring Dike** – A ring dike will be provided (100-yr +3 feet) around the Dwyer Residence to protect it from flooding.

Levee (100-yr Protection)

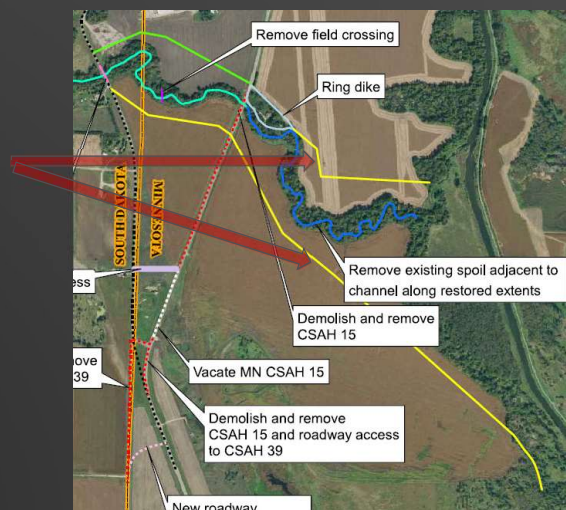


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## PROJECT COMPONENTS



- **Agricultural Levee** – Agricultural levees will be provided to protect fields from the 10-year event.

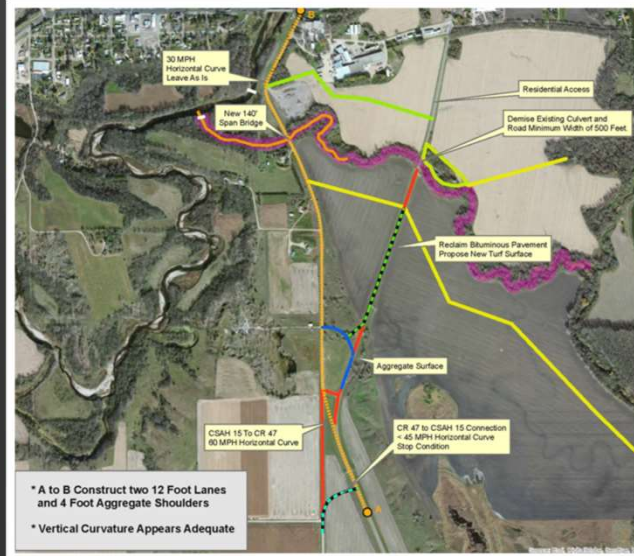


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## PROJECT COMPONENTS



- **Transportation Improvements**
  - Rather than constructing two parallel new bridges over the restored channel, CSAH 15 will be demised and CR 39 will be improved.



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## PROJECT COMPONENTS



- **Waste Discovery & Relocation**
  - Land purchase due diligence
  - Phase 1
  - Limited Phase 2
  - Cost estimating for waste removal options
    - Project avoidance
    - Partial Removal
    - Total Removal



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# PROJECT IMPACTS

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## PROJECT IMPACTS

- Restoration & Hydrology
  - Reestablish floodplain and floodplain wetlands along the Whetstone River to the beginning of the Minnesota River
    - Flow will be restored to 9,000 feet of the Whetstone River channel between Big Stone Lake and the confluence with the Minnesota River

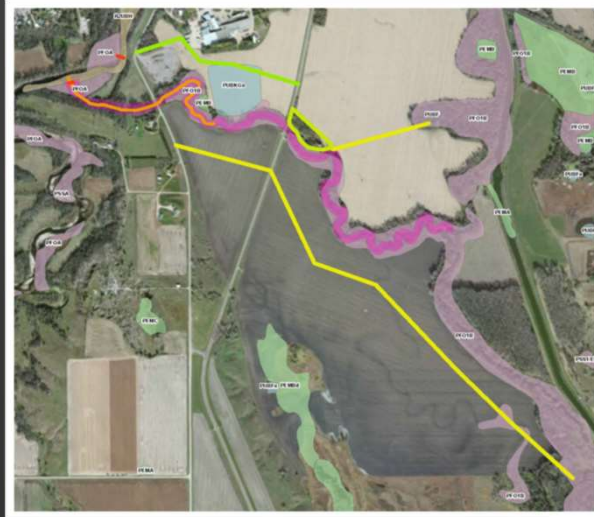


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## PROJECT IMPACTS



- Restoration of historic riverine and floodplain habitats
- Benefits
  - Restoration of floodplain wetland= additional flood storage = duck and wildlife habitat
  - Fish passage
  - Invertebrate habitat
  - Riverine wetland plant communities



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## PROJECT IMPACTS



- Water Quality

ALTERNATIVE	Average Annual Volume (acre-feet/year)	Estimated Average Annual Load Reaching Big Stone Lake from Whetstone River		Estimated % Annual Load Reduction From Existing Conditions	
		Total Phosphorus (lbs/yr)	Total Suspended Solids (tons/yr)	Total Phosphorus	Total Suspended Solids
Existing Conditions	6,403	3341	556	0%	0%
Alternative 1 Low Flow / DNR Bankfull Channel	3,348	1747	291	48%	48%
Alternative 2 2 Year Compound Channel	2,033	1061	176	68%	68%
Alternative 3 5 Year Channel, Riparian Maintenance	368	192	32	94%	94%

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## PROJECT IMPACTS



- Reduced water surface elevations on Big Stone Lake.

	Alternative 1 Low Flow / DNR Bankfull Channel	Alternative 2 & 2B* 2 Year Compound Channel	Alternative 3 5 Year Channel, Riparian Maintenance
Big Stone Lake 100 year Elevation Reduction	0.65	1.14	2.02
Big Stone National Wildlife Refuge (downstream of Highway 17) Elevation Increase	0.40	0.72	1.31
Highway 75 Dam 100 year Elevation Increase	0.24	0.43	0.79

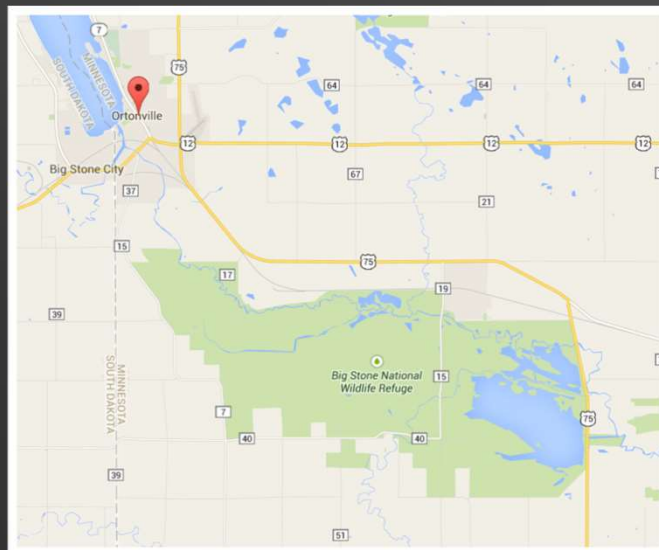
\*Alternative 2B will be less than alternative 2 because of setback levees.  
 \*\*These reductions assume a 100 year flood on Big Stone Lake caused by a 100 year flood on the Whetstone River, different flood mechanism could result in less of a reduction

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## PROJECT IMPACTS



- Increased water surface elevations in the Big Stone National Wildlife Refuge and at the Highway 75 Dam.



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## PROJECT IMPACTS



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## PROJECT IMPACTS



### Water Surface Elevations

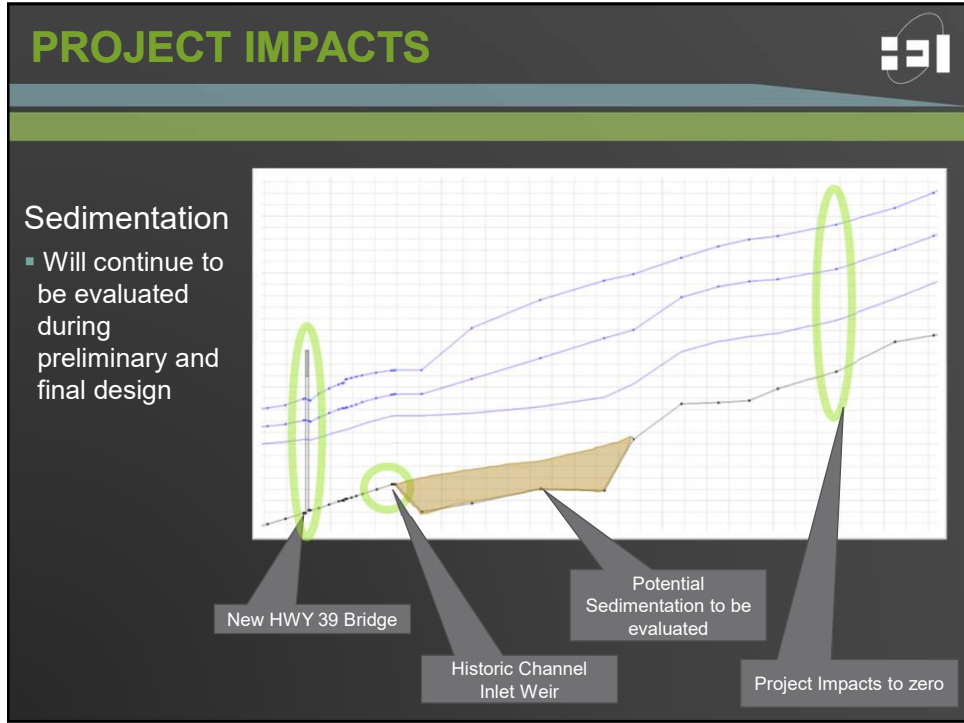
- Will continue to be evaluated during preliminary and final design

Water Surface Impacts:  
 2-year = 3.1 feet  
 10-year = 0.8 ft  
 100-year = -0.1 ft

Water Surface Impacts:  
 2-year = 0.0 feet  
 10-year = 0.0 ft  
 100-year = 0.0 ft



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# PROJECT FUNDING

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## PROJECT FUNDING

- Flood Damage Reduction Grant  
(MN Project Design & Permitting for MN Features ONLY)
- Minnesota Clean Water Partnership  
(SD Project Design & Permitting)
- Local/District Matching Funds
- Other

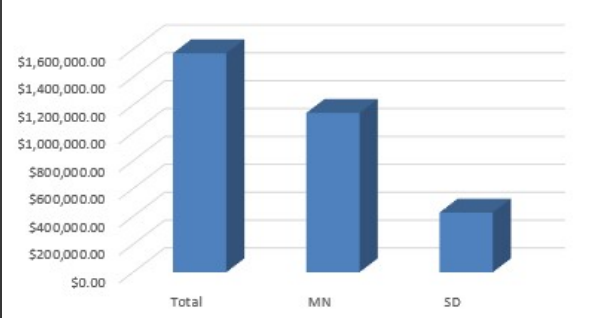
**Estimated Total Cost: \$8,106,394**




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## PROJECT FUNDING

- Phase 1 – 4 (Engineering Design & Permitting)
- Design & Permitting
- Land Purchase
- Easements



Category	Amount
Total	\$1,590,000.00
MN	\$1,200,000.00
SD	\$390,000.00



**\$590K from DNR Grant**

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## PROJECT FUNDING



### Phase 5 (Construction)

- Year 1
  - MN Channel
- Year 2+
  - Hydraulic Connections
  - Levees &
  - Transportation



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## PROJECT FUNDING CHALLENGES

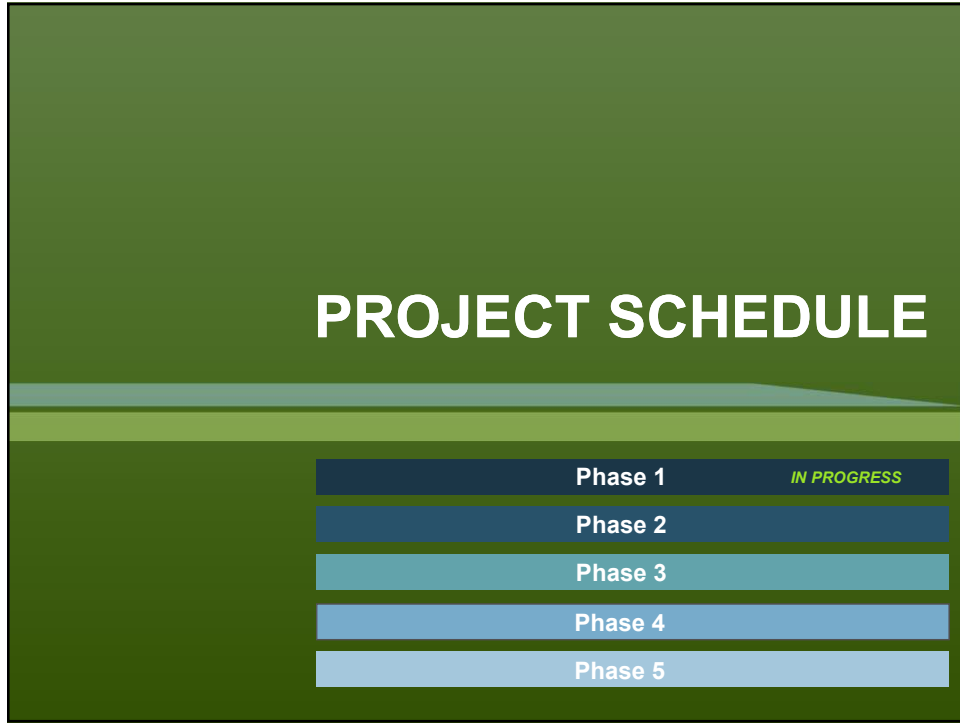


- Project funding
  - Use of FDR grant for MN Design & Permitting
  - Funding deficient for SD Design & Permitting



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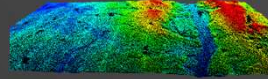


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## WORK COMPLETED



- LiDAR Survey
- Wetland Assessment
- Hedge property surveys (certificates and/or plats)
- Land Purchase Agreement with primary landowner



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## UPCOMING WORK



- |                                 |   |
|---------------------------------|---|
| ▪ Field Data Collection         | ▪ Transportation Design                         |
| ▪ Environmental Permitting      | ▪ Development of Preliminary Construction Plans |
| ▪ Transportation Permitting     | ▪ Right-of-Way/Easements                        |
| ▪ Undocumented Waste Management | ▪ Geotechnical Analysis                         |
| ▪ Civil Design                  |   |

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